CLAIMS

We claim:

1. A method for determining process parameters of an integrated circuit interconnect, the method comprising:

determining a first set of coupling capacitance associated with a test structure;

calculating a second set of coupling capacitance associated with the test structure; and

determining the process parameters of the integrated circuit using the first set of coupling capacitances and the second set of coupling capacitances.

2. The method of Claim 1 wherein determining the first set of coupling capacitances associated with the test structure comprises:

determining a first capacitance between a first plate and a first conductor or a second conductor; and

determining a second capacitance between a second plate and the first or the second conductor.

3. The method of Claim 1 wherein calculating a second set of coupling capacitances associated with the test structure comprises:

inputting initial process parameters into a field solver; and

calculating the second set of coupling capacitances using the field solver.

4. The method of Claim 1 wherein determining the process parameters of the integrated circuit using the first set of coupling capacitances and the second set of coupling capacitances comprises:

comparing the first set of coupling capacitances with the second set of coupling capacitances; and

when the difference between the first set of coupling capacitances and the second set of coupling capacitances are less than a predetermined value, determining that the physical process parameters are equivalent to initial process parameters.

5. The method of Claim 1 wherein determining the process parameters of the integrated circuit using the first set of coupling capacitances and the second set of coupling capacitances comprises:

comparing the first set of coupling capacitances with the second set of coupling capacitances; and

when the difference between the first set of coupling capacitances and the second set of coupling capacitances are more than a predetermined value, generating modified process parameters.

6. The method of Claim 1 wherein determining a first set of coupling capacitance associated with a test structure comprises:

determining a first capacitance between a first plate and a first conductor or a second conductor;

determining a second capacitance between a second plate and the first conductor or the second conductor; and

determining a third capacitance between the first conductor and the second conductor.

7. The method of Claim 6 wherein the first plate, the second plate, the first conductor and the second conductor are made of copper.

8. The method of Claim 1 wherein the test structure is made of copper.

9. The method of Claim 1 wherein the test structure is in electrical communication with a charge-based capacitance measurement (CBCM) circuit.

10. The method of Claim 1 wherein a cross-section of the test structure is non-rectangular.

11. A method for determining coupling capacitances of a test structure within an integrated circuit, the test structure comprising a first plate, a second plate, a first conductor disposed between the first plate and the second plate, and a second conductor disposed between the first plate and the second plate, the method comprising:

determining a first capacitance between the first plate and the first conductor or the second conductor;

determining a second capacitance between the second plate and the first or the second conductor; and

determining a third capacitance between the first conductor and the second conductor.

12. The method of Claim 11 wherein the first plate, the first conductor, the second conductor, and the second plate are made of copper.

13. The method of Claim 11 wherein the shapes of the first conductor and the second conductor are symmetrical.

14. The method of Claim 11 wherein both the first conductor and the second conductor have

a comb shape.

15. The method of Claim 11 wherein both the first conductor and the second conductor have a maze shape.

16. The method of Claim 11 wherein both the first conductor and the second conductor have a serpentine shape.

17. The method of Claim 11 wherein both the first plate and the second plate are solid plates.

18. The method of Claim 11 wherein both the first pate and the second plate are or slotted plates.

19. The method of Claim 11 wherein first plate is in electrical communication with a first probe pad, the first conductor is in electrical communication with a second probe pad, the second conductor is in electrical communication with a third probe pad, and the second plate is in electrical communication with a fourth probe pad.

20. The method of Claim 11 wherein the first plate is in electrical communication with a first multiplexer, the first conductor is in electrical communication with a second multiplexer, the second conductor is in electrical communication with a third multiplexer, and the second plate is in electrical communication with a fourth multiplexer and wherein the first plate, the first multiplexer, the first conductor, the second multiplexer, the second conductor, the third multiplexer, the second plate, and the fourth multiplexer are contained within a single integrated circuit.

21. The method of Claim 11 wherein a cross-section of the first conductor is non-rectangular and a cross-section of the second conductor is non-rectangular.

22. An integrated circuit including at least one test structure, the test structure comprising:

a first conductive plate;

a second conductive plate;

a first conductor located between the first conductive plate and the second conductive plate;

a second conductor located between the first conductive plate and the second conductive plate; and

a current measurement circuit in electrical communication with the first conductive plate, the second conductive plate, the first conductor, and the second conductor.

23. The integrated circuit of Claim 22 wherein the first conductive plate, the first conductor, the second conductor, and the second conductive plate are made of copper.

24. The integrated circuit of Claim 22 wherein the shapes of the first conductor and the second conductor are symmetrical.

25. The integrated circuit of Claim 22 wherein both the first conductor and the second conductor have a comb shape.

26. The integrated circuit of Claim 22 wherein both the first conductor and the second conductor have a maze shape.

27. The integrated circuit of Claim 22 wherein both the first conductor and the second conductor have a serpentine shape.

28. The integrated circuit of Claim 22 wherein both the first conductive plate and the second conductive plate are solid plates.

29. The integrated circuit of Claim 22 wherein both the first conductive plate and the second conductive plate are slotted plates.

30. The integrated circuit of Claim 22 wherein a cross-section of the first conductor is non-rectangular and a cross-section of the second conductor is non-rectangular.